

In the Claims

For purposes of Appeal, claims 10 and 19 have been canceled, such that, a listing of the pending claims is as follows:

1. (previously presented) An optical pellicle comprising:

a transparent plate;

a recessed portion of said transparent plate having a first thickness;

a perimeter of said transparent plate having a second thickness ranging from about 3mm to about 6mm and entirely surrounding said recessed portion such that said transparent plate comprises a monolithic optical pellicle; and

a plurality of openings traversing through said perimeter for introducing a gas flow over said recessed portion upon mounting said monolithic optical pellicle to a photomask.

2. (original) The optical pellicle of claim 1 wherein said transparent plate comprises a material selected from the group consisting of silica, modified silica, quartz and modified fused silica quartz.

3. (previously presented) The optical pellicle of claim 1 wherein said first thickness ranges from about 200 μ m to about 900 μ m.

4. (canceled)

5. (canceled)

6. (original) The optical pellicle of claim 1 wherein said transparent plate comprises a material transparent to an exposure radiation ranging from about 157nm wavelengths and lower.

7. (canceled)

8. (canceled)

9. (previously presented) The optical pellicle of claim 1 wherein said first thickness of said recessed portion prevents sagging of said recessed portion due to applied forces on said monolithic optical pellicle.

10. (canceled)

11. (original) The optical pellicle of claim 1 wherein said recessed portion extends into said transparent plate from a single surface thereof and stops at a depth within said transparent plate.

12. (original) The optical pellicle of claim 1 wherein said monolithic optical pellicle comprises a single material having a single thermal expansion.

13. (original) The optical pellicle of claim 1 wherein said perimeter comprises a frame portion and said recessed portion comprises an optical pellicle portion of said monolithic optical pellicle, said frame and optical pellicle portions being a uniform one-piece structure.

14. (previously presented) The optical pellicle of claim 1 wherein said monolithic optical pellicle comprises a first side having a substantially planar surface and a second side having said recessed portion and said perimeter, wherein at least said recessed portion has an optically flat surface area.

15. (previously presented) The optical pellicle of claim 1 wherein said monolithic optical pellicle has a rectangular shape.

16. (previously presented) The optical pellicle of claim 1 further including a plurality of air filters within said plurality of openings for preventing particles from passing through said perimeter onto said photomask.

17. (previously presented) The optical pellicle of claim 1 wherein said plurality of openings traversing through said perimeter have shapes selected from the group consisting of circular, oval, rectangular, square and combinations thereof.

18. (previously presented) A method of forming an optical pellicle comprising:

providing a pellicle plate of a transparent material having a first thickness ranging from about 3mm to about 6mm; and

removing a portion of said transparent material to transform said pellicle plate into a monolithic optical pellicle comprising a recessed portion of said pellicle plate having a

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second thickness less than said first thickness, and a perimeter frame that entirely surrounds and is integrally formed with said recessed portion of said pellicle plate.

19. (canceled)

20. (original) The method of claim 18 wherein said transparent material comprises a single material having a single thermal expansion that is transparent to an exposure radiation ranging from about 157nm wavelengths and lower.

21. (previously presented) The method of claim 18 wherein said second thickness of said recessed portion ranges from about 200 μ m to about 900 μ m .

22. (previously presented) The method of claim 18 wherein said perimeter frame of said pellicle plate has said first thickness.

23. (previously presented) The method of claim 18 further including adjusting for a standoff distance between said monolithic optical pellicle and a photomask to which said monolithic optical pellicle is to be mounted to, said step of adjusting for said standoff distance comprising:

said perimeter frame of said pellicle plate initially having said first thickness; and
removing a predetermined thickness from said first thickness of said perimeter frame to provide said perimeter frame with a third thickness, which is less than said first thickness.

24. (previously presented) The method of claim 18 wherein said second thickness of said recessed portion prevents sagging of said recessed portion due to applied forces on said monolithic optical pellicle.

25. (original) The method of claim 18 wherein said step of transforming said pellicle plate into said monolithic optical pellicle comprises:

providing said pellicle plate into a processing chamber;

providing a mask on a first side of said pellicle plate to cover only a perimeter area of said pellicle plate, thereby exposing a central portion of said pellicle plate on said first side;

removing said transparent material of said pellicle plate from said exposed central portion on said first side whereby said mask protects said perimeter area of said pellicle plate such that said transparent material at said perimeter area is maintained;

stopping said removal at a predetermined distance within said pellicle plate to integrally form said recessed portion and said perimeter frame on said first side of said pellicle plate; and

removing said mask to provide said monolithic optical pellicle.

26. (original) The method of claim 25 further including the steps of:

planarizing said recessed portion on said first side of said pellicle plate to provide said monolithic optical pellicle with a first optically flat surface at said recessed portion; and
planarizing an opposing second side of said pellicle plate to provide said monolithic optical pellicle with a second optically flat surface.

27. (original) The method of claim 18 further including the step of providing a plurality of openings traversing through said perimeter frame of said pellicle plate of said monolithic optical pellicle for introducing a gas flow over said recessed portion of said pellicle plate.

28. (original) The method of claim 27 further including the step of mounting said monolithic optical pellicle to a photomask by attaching said perimeter frame to said photomask, said mounted monolithic optical pellicle protecting said photomask during subsequent processing.

29. (previously presented) The method of claim 28 further including the step of detaching said monolithic optical pellicle from said photomask whereby damage to said monolithic optical pellicle is avoided as a result of said recessed portion being integrally formed with said perimeter frame.

30. (previously presented) A method of protecting a photomask during photolithography comprising:

providing a photomask; and

attaching a monolithic one-piece optical pellicle having a recessed portion with a thickness ranging from about 200 μ m to about 900 μ m and a frame with a thickness ranging from about 3mm to about 6mm to said photomask for protecting said photomask during subsequent photolithography processing.

31. (previously presented) The optical pellicle of claim 1 wherein said monolithic optical pellicle has a square shape.

32. (previously presented) The optical pellicle of claim 1 wherein said monolithic optical pellicle has a circular shape.

33. (previously presented) The method of claim 30 wherein said monolithic one-piece optical pellicle is vertically mounted to said photomask.

34. (previously presented) The method of claim 30 wherein said monolithic one-piece optical pellicle is horizontally mounted to said photomask.